

- V. "On the Steam Calorimeter." By J. JOLY, M.A. Communicated by G. F. FITZGERALD, F.R.S., F.T.C.D. Received November 26, 1889.

(Abstract.)

The theory of the method of condensation has been previously given by the author in the 'Proceedings of the Royal Society,' vol. 41, p. 352.

Since the publication of that paper a much more extended knowledge of the capabilities of the method has been acquired, which has led to the construction of new forms of the apparatus, simple in construction and easily applied. Two of these are described and illustrated, one of which is new in principle, being a differential form of the calorimeter. The accuracy of observation attained by this latter form is so considerable that it has been found possible to estimate directly the specific heats of the gases at constant volume to a close degree of accuracy.

An error incidental to the use of the method arising from the radiation of the substance, when surrounded by steam, to the walls of the calorimeter, is inquired into. It is shown that this affects the accuracy of the result to a very small degree, and is capable of easy estimation and elimination.

Further confirmation of the truth of the method is afforded in a comparison of experiments made in different forms of the steam calorimeter.

Various tables of constants are given to facilitate the use of the method, and the results of experiments on the density of saturated steam at atmospheric pressures, made directly in the calorimeter, are included. These are concordant with the deductions of Zeuner, based on Regnault's observations on the properties of steam, and were undertaken in the hope of affording reliable data on which to calculate the displacement effect on the apparent weight of the substance transferred from air to steam.

The communication is intended to provide a full account of the mode of application of the steam calorimeter.

- VI. "On the Extension and Flexure of Cylindrical and Spherical Thin Elastic Shells." By A. B. BASSET, M.A., F.R.S. Received December 9, 1889.

(Abstract.)

The usual theory of thin elastic shells is based upon the hypothesis that the three stresses R , S , T , may be treated as zero, where R is the